

## CLAIMS.

1. A converter apparatus for producing, from a first encoded signal supplied by a data source in a first encoding format at a first data rate, a second signal encoded in a second encoding format at a second data rate, said converter apparatus comprising:

- decoding means for decoding the first encoded signal and for producing a decoded signal,
- encoding means for encoding said decoded signal into a second encoded signal,
- clock recovery means comprising an oscillator having a control frequency controlled by two complementary loops for producing a symbol clock for the encoding means, which is locked on the first data rate, the two complementary loops including a coarse loop using a free running reference clock and programmable dividing means for enabling the oscillator to reach a frequency which is close to a predetermined nominal frequency within a predefined tolerance range, and a fine loop using buffering means allowing control of the second data rate with respect to the first data rate by increasing / decreasing the oscillator-controlled frequency when the buffering means fills up / empties,
- control means for controlling the decoding means, the encoding means and the coarse loop dividing means.

2. A converter apparatus as claimed in claim 1, wherein the buffering means include a First Input First Output buffer having a current filling rate and which fills up at the first data rate and empties at the second data rate, the control frequency of the oscillator being controlled with respect to an estimation of a difference between the current filling rate and a predetermined nominal filling rate.

3. A converter apparatus as claimed in claim 1, wherein the second data rate corresponds to a second symbol frequency, the symbol clock of the encoding means being a multiple of the second symbol frequency.

4. A converter apparatus for producing, from a first encoded signal supplied by a data source in a first encoding format at a first data rate, a second signal encoded in a second encoding format at a second data rate, said converter apparatus comprising:

- decoding means for decoding the first encoded signal and for producing a decoded signal,
- encoding means for encoding said decoded signal into a second encoded signal,
- clock recovery means comprising an oscillator having a control frequency controlled by a control loop for producing a symbol clock for the encoding means, which is locked on the first data rate, the control loop using buffering means allowing control of the second data rate with respect to the first data rate by increasing / decreasing the oscillator-controlled frequency when the buffering means fills up / empties,
- control means for controlling the decoding means, the encoding means and for forcing a nominal value into the oscillator corresponding to a nominal symbol clock rate for the encoding means.

5. A receiver for receiving a DVB-S signal encoded in the Satellite Digital Video Broadcasting format (DVB-S), said receiver comprising a converter device for producing, from a received OFDM modulated DVB-T signal, a QPSK modulated signal encoded in the Satellite Digital Video Broadcasting format (DVB-S), said converter device comprising:

- demodulation means for demodulating the received OFDM modulated DVB-T signal and for providing a demodulated DVB-T signal,
- modulation means for re-modulating said demodulated DVB-T signal in an QPSK modulated signal,
- clock recovery means comprising an oscillator having a frequency controlled by two complementary loops, for providing a symbol clock for the QPSK modulator, which is locked on the OFDM modulated DVB-T signal data rate, the two complementary loops including a coarse loop using a free running reference clock and programmable dividing means for enabling the oscillator to reach a frequency which is close to a predetermined nominal frequency within a predefined range, and a fine loop using buffering means allowing control of the data rate between the OFDM demodulator and the QPSK modulator by

increasing / decreasing the oscillator controlled frequency when the buffering means fills up / empties,

- control means for controlling the demodulation means, the modulation means and the coarse loop dividing means.

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6. A receiver for receiving a DVB-S signal encoded in the Satellite Digital Video Broadcasting format (DVB-S), said receiver comprising a converter device for producing, from a received OFDM modulated DVB-T signal, a QPSK modulated signal encoded in the Satellite Digital Video Broadcasting format (DVB-S), said converter device comprising:

- 10 • demodulation means for demodulating the received OFDM modulated DVB-T signal and for providing a demodulated DVB-T signal,
- modulation means for re-modulating said demodulated DVB-T signal into a QPSK modulated signal,
- 15 • clock recovery means comprising an oscillator having a control frequency controlled by a control loop for producing a symbol clock for the encoding means, which is locked on the the OFDM modulated DVB-T signal data rate, the control loop using buffering means allowing control of the data rate between the OFDM demodulator and the QPSK modulator by increasing / decreasing the oscillator
- 20 controlled frequency when the buffering means fills up / empties,
- control means for controlling the demodulation means, the modulation means and for forcing a nominal value into the oscillator corresponding to a nominal symbol clock rate for the modulation means.

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